



ORIGINAL ARTICLE

Eating Pattern, Dietary Diversity and Nutritional Status of Children and Adolescents Residing in Orphanages in Southwestern Nigeria

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Keywords

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ABSTRACT

Background: The population of orphaned children is increasing at devastating levels especially in sub-Saharan Africa. In Nigeria, only very little is known about the eating pattern, dietary diversity and the nutritional status of children living in orphanages. This study therefore aimed to assess the eating pattern, dietary diversity and the nutritional status of children residing in orphanages in southwestern Nigeria.

Methods: The study was a descriptive cross-sectional study among 260 children in selected orphanages in Lagos State, south-western Nigeria, selected using two-stage sampling technique. The nutritional status of the respondents was assessed using the World Health Organization (WHO) growth reference values of 2007. Data were analyzed using the IBM SPSS version 24.0. The confidence interval was set at 95% with significant level at $p < 0.05$.

Results: Majority of the respondents (52.7%) were adolescents (10-19 years), 54.6% were females, 90.4% were attending schools and 90.0% were single-orphans. Majority of the respondents consumed fruits (97.7%), vegetables (80.0%), animal proteins (96.2%) and carbohydrates (96.2%) more than 3 times in the week preceding the study. The mean dietary diversity (DD) score was 4.6 ± 0.5 , with 150 (57.3%) of the respondents having a high dietary diversity. Using BMI-for-age, 177 (68.1%) of the respondents were underweight and 23 (8.9%) were overweight/obese.

Conclusion: Majority of the children living in orphanages were underweight, despite the reported healthy eating patterns and high dietary diversity. There is the need for nutritional interventions targeted at children living in orphanages in Nigeria.

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INTRODUCTION

The population of orphaned children is increasing at devastating levels especially in sub-Saharan Africa, mainly due to conflicts and HIV/AIDS.^{1,2} The United Nations

Children's Fund (UNICEF) estimated that as at 2010, there were 153 million orphaned children and adolescents living in the world.³ While 13% of the world's children under the age of 18 years live in sub-Saharan Africa, 36% of the world's orphans

live in the region.³ Approximately 27% of these orphans were orphaned due to AIDS.^{3,4} Sub-Saharan Africa has been reported to have the greatest proportion of AIDS orphans, with an estimate of 12.3 million orphaned children.⁵ Different reports from the Joint United Nations Programme on HIV/AIDS (UNAIDS) and UNICEF put Nigeria as having the highest number of AIDS orphans in the region.^{5, 6} UNICEF projected that 8.2 million children in Nigeria would be orphaned by 2010, and this is about 10% of the children in the country.⁷

Many of these orphans get absorbed into the traditional extended family settings,² but a number of them are raised in orphanages. The proportion of children in orphanages may actually be increasing now because of the gradual breakdown of the extended family settings in many parts of Africa.⁸ Over 90% of all orphans not living with a surviving parent are cared for by extended families.⁹ Many caretakers are not capable of providing care simply because of ill health or old age.¹⁰

Orphaned children are at increased risk of health and social problems.^{11, 12} A study by UNICEF has reported that orphans are more likely to be stunted in their growth and less likely to be enrolled in school than children living with both parents. In general, poor nutrition and limited access to health services put orphans at increased risk of starvation, illness and death.¹³ A study conducted by Sarker et al² in Uganda found that orphans had a significantly higher

prevalence of self-reported morbidity compared to non-orphans. Hall et al¹⁴ in their study on the health and nutrition of orphan schoolchildren in Ethiopia, also found that orphans were less cared for than the other children. Concerning the effect of orphan status on the nutritional status of children, while a number of studies have found significant association,¹¹ other studies have reported no significantly poorer nutritional status among orphaned compared to non-orphaned children.^{2, 14, 15}

In Nigeria, only very little data exists on the eating pattern, dietary diversity and the nutritional status of children living in orphanages, and no data have been published for Lagos State. Dietary diversity is a measure of the diet quality, based on the number of food groups consumed in the previous 24-hours period, and is receiving increasing attention in nutritional surveys.¹⁶ This study therefore, described the eating pattern, dietary diversity and nutritional status of children residing in orphanages in Lagos State, south-western Nigeria. It is envisaged that data from this study will be useful for health policy makers, educators and other stakeholders in planning appropriate intervention programmes targeting children in orphanages in Lagos State and other parts of Nigeria.

METHODOLOGY

The study was carried out in Lagos State, Nigeria between January and June, 2019. The state is located in the south-western

geopolitical zone of Nigeria. Lagos State is an economically important state of the country. The study was a descriptive cross-sectional study, with the study population being children and adolescents, 2-19 years, residing in orphanages in Lagos State, southwestern Nigeria. These orphanages are either owned by the government or private organizations. The government owned orphanages are mainly funded by the government including the employment and payment of the staff or caregivers. The privately-owned orphanages are mainly funded by missions/religious organizations, and were mostly located within mission hospitals or worship centres. The sample size was calculated using the Leslie Fisher's formula for an estimated population of 1,500 children. A sample size of 253 was derived using a prevalence of 27.2%,¹⁷ which is the prevalence of stunted children from a previous similar study on nutritional status of children living in motherless babies' homes in Enugu State, southeast Nigeria. This was then rounded off to 260.

A self-developed structured questionnaire was used to obtain information from 260 children residing in 10 orphanages in Lagos State using two-stage sampling technique. In the first stage, 10 orphanages (5 privately- and 5 publicly-owned) who consented were purposively selected. Proportional allocation was used to determine the number of children to be selected in each of the 10 orphanages, and in the final stage, the children were selected using simple random sampling technique (balloting method) until the proportionally

allocated sample size for each orphanage was met. A pre-test was done using 10% (26 questionnaires) of the sample size in an orphanage outside of the 10 selected ones in Lagos State. The Camry® electronic weighing scale and stadiometer were used to assess the nutritional status of the respondents. The questionnaires were interviewer-administered while the anthropometric measurements were taken according to standard protocols recommended by the International Society for the Advancement of Kinanthropometry (ISAK).¹⁸ The weight of each participant was measured in their underclothes, barefoot and the pupils stood still without support. The height of each participant was taken as the maximum vertical distance from the floor to the highest point on the skull (i.e. the vertex) when the head is held in the Frankfurt plane. The pupils stood erect, barefoot, heels together, both heels touching the base of the stadiometer and arms hanging freely by the sides.

Information was sought about the frequency of food consumption for different food types and also about the physical activity patterns of the children. This was done by asking for the number of times foods in specified food groups were taken in the week preceding the study. Similarly, the week preceding the study was used as the reference for the activity patterns of the respondents. The respondents' 24-hour dietary recall was done, and a point was awarded to each of the seven food groups (grains/roots/tubers, legumes/nuts, dairy products, flesh foods, eggs, vitamin A-rich fruits/vegetables and

other fruits/vegetables) consumed by the respondents over the reference period, and the sums of all points were calculated for the dietary diversity score (DDS) for each respondent, as recommended by the World Health Organization.¹⁹ Hence, the dietary diversity score ranged from 0-7, with minimum of 0 if none of the food groups was consumed and 7, if all the food groups were consumed. From the dietary diversity scores derived, minimum of four points was considered as high dietary diversity while $DDS < 4$ was low dietary diversity using the World Health Organization (WHO) recommended cut off point for minimum dietary diversity.¹⁹

The nutritional status of the respondents was assessed using the WHO growth reference values of 2007.²⁰ Respondents with z-scores less than -2 were classified as stunted (height-for-age; applicable to all children), wasted (weight-for-height; only for under-five children) and underweight (weight-for-age; not for children older than 10 years). BMI-for-age was used to categorize the respondents into underweight (z-scores < -2), normal (z-scores of -2 to +1), overweight (z-scores $> +1$ to +2) and obesity (z-scores $> +2$).

The questionnaires were manually sorted out, entered into a computer and the obtained data were analyzed using IBM SPSS version 23.0. Frequency distribution tables were generated and the chi-square test was used at bivariate analysis level to compare categorical data. Significant

findings were taken as p-value less than 0.05.

Ethical approval for the study was obtained from the ethical review committee of LAUTECH Teaching Hospital, Osogbo. Permission was obtained from Lagos State Ministry of Women Affairs and the Heads of selected orphanages. Informed consent was also obtained for all the respondents included in the study from their caregivers, and assent was obtained from children less than 18 years. All information gathered was kept confidential and participants were identified using only serial numbers.

RESULTS

A total of 260 children, selected from orphanages in Lagos State were included in the study with an age range of 2 – 19 years. Of these, 33 (12.7%) were under-five years, 90 (34.6%) were 5 – 9 years and 137 (52.7%) were 10 – 19 years. The male to female ratio was 1:1.2, with the status of the fathers and mothers unknown for most of the children. Two hundred and thirty-five (90.4%) were attending school, and 111 (47.2%) of these were in the secondary school. Most of the children, 234 (90.0%) were single orphans, while 15 (5.8%) were double orphans and 11 (4.2%) were not orphans, but were there due to medical challenges of the mother (Table 1). Majority of the orphanages 176 (67.7%) had 11 – 20 children and more than 5 caregivers 189 (72.7%), with 215 (83.1%) having caregivers to children ratio greater than 2:1. Concerning means of receiving children into the orphanages, 174 (66.9%) of

the children were brought to the orphanages by government officials/institutions.

Table 1: Socio-Demographic Characteristics of Respondents

Variables	Frequency (n = 260)	Percent
Age groups (in years)		
Under-5	33	12.7
Primary school-age (5 - 9)	90	34.6
Adolescents (10 - 19)	137	52.7
Sex		
Male	118	45.4
Female	142	54.6
Father's status		
Unknown	229	88.1
Known, alive	18	6.9
Known, dead	13	5.0
Mother's status		
Unknown	232	89.2
Known, alive	4	1.5
Known, dead	24	9.2
Schooling status		
Attending school	235	90.4
Not attending school**	25	9.6
Level of education		
No formal education	25	9.6
Crèche/nursery	51	19.6
Primary	73	28.1
Secondary	111	42.7
Orphan status		
Single orphan	234	90.0
Double orphan	15	5.8
*Not orphan	11	4.2

n - number of respondents

* in orphanages because of maternal mental/other medical health challenges

** Young children yet to start school

The frequency of food consumption of the respondents in the week preceding the study is shown in Table 2, with majority of the respondents consuming fruits 254 (97.7%), animal proteins 250 (96.2%), carbohydrates 250 (96.2%), plant proteins 248 (95.4%), eggs 241 (92.7%) and vegetables 208 (80.0%), more than 3 times in the week preceding the week of study.

The activity patterns of the respondents in the week preceding the study are shown in Table 3. Only 8 (3.1%) of the children were

involved in vigorous activity for up to or more than 3 days a week. Majority of the children however, slept for 8 hours or less, 257 (98.8%), had an hour or less of TV/video/satellite consumption 254 (97.7%) and spent an hour or less on video games and the internet 257 (98.8%). The mean dietary diversity (DD) score was 4.6 ± 0.5 , after categorizing the dietary scores, 149 (57.3%) had a high dietary diversity while 111 (42.7%) had low dietary diversity.

The nutritional status of the respondents is as shown in Table 4. The prevalence of stunting was 62.3%, wasting (among the 33 under-five children) was 60.6% and underweight (among the 145 children 10 years and younger) was 55.9%. Using BMI-for-age, 177 (68.1%) were underweight and 23 (8.9%) were overweight/obese.

On bivariate analysis (Table 5), the nutritional status of the respondents was significantly associated with their age groups ($p < 0.001$), sex ($p = 0.036$) and their levels of education ($p = 0.025$). The relationships were such that school-aged children (5 – 9 years), females and primary school children were more likely to be underweight compared to the others. There was a statistically significant relationship between the nutritional status of respondents and the frequency of involvement in vigorous activities ($p = 0.023$), but the relationship between nutritional status and dietary diversity was not statistically significant ($p = 0.738$) (Table 6). Those that rarely or were never involved

in physical activity were more likely to be overweight/obese.

Table 2: Frequency of Food Consumption by Respondents

Food types	Number of times consumed per week*	
	≤ 3 times (%)	> 3 times (%)
Fruits	6 (2.3)	254 (97.7)
Animal protein (meat, fish)	10 (3.8)	250 (96.2)
Carbohydrates (e.g. amala, eba, yam etc)	10 (3.8)	250 (96.2)
Plant proteins (beans, soya, moi moi, akara)	12 (4.6)	248 (95.4)
Eggs	19 (7.3)	241 (92.7)
Vegetables	52 (20.0)	208 (80.0)
Sweets (chocolate, candy, ice cream)	160 (61.5)	100 (38.5)
Pastries (cake, cookies, meat/fish pies etc.)	229 (88.1)	31 (11.9)
Sugar-Sweetened Drinks (coca cola, juice etc.)	233 (89.6)	27 (10.4)
Food from eateries	260 (100.0)	0 (0.0)

*n = 260 *The week preceding the study was used as the reference week*

DISCUSSION

The demographic characteristics of the respondents were similar to what was found by Eke et al ¹⁷ in motherless babies' homes in Enugu State in Nigeria where more than 90% were attending school. This finding is a good development, because children in orphanages are considered to be underprivileged members of the society and for them to have up to 90% school enrolment rate is encouraging. Expectedly, nearly all the children in the selected orphanages were orphans, with majority of them being single orphans. Only little information could be retrieved about the family characteristics of the respondents. These factors, if known, would have been tested as possible factors associated with the nutritional status of the respondents, and would have improved the understanding of the determinants of the nutritional status of the respondents.

The eating patterns of the respondents were generally encouraging, with majority of the children eating healthy food types

frequently. The diet quality (using the dietary diversity) was also relatively high among the respondents, with nearly three-fifths of the children having high dietary diversity. The findings in the literature on the eating patterns and dietary diversity among orphaned children is rather inconsistent.

Table 3: Activity Patterns among respondents

Variables	Frequency	Percent
Frequency of involvement in vigorous^v activity		
Rarely/never	122	46.9
< 3 days a week	130	50.0
≥ 3 days a week	8	3.1
Average hours of sleep per day		
≤ 8 hours	257	98.8
> 8 hours	3	1.2
Average time spent watching TV/Video /Satellite daily		
≤ 1 hour	254	97.7
> 1 hour	6	2.3
Average time spent with video games/ computer/ internet daily		
≤ 1 hour	257	98.8
> 1 hour	3	1.2

n - number of respondents TV - television

^v - any activity like brisk walking, running, juggling, sports, farming etc. that was engaged for a minimum of 10 minutes and sufficient to make respondents sweat

Table 4: Nutritional Status of Respondents

Variables	Frequency	Percent
Weight-for-height (n = 33^a)		
Wasted	20	60.6
Normal	13	39.4
Height-for-age (n = 260)		
Stunted	162	62.3
Normal	98	37.7
Weight-for-age (n = 145^b)		
Underweight	81	55.9
Normal	64	44.1
^cBMI-for-age (n = 260)		
Underweight	177	68.1
Normal	60	23.1
Overweight	14	5.4
Obesity	9	3.5

a – number of children under-five for which the weight-for-height indicator (wasting) is used

b – number of children 10 years and younger for which the weight-for-age (underweight) is used

c – Body Mass Index

Table 5: Relationship between Nutritional Status and Socio-demographic Characteristics of Respondents

Variable	Nutritional status			Statistics
	Underweight n (%)	Normal n (%)	Overweight n (%)	
Age groups (in years)				
Under-5	20 (60.6)	2 (6.1)	11 (33.3)	$\chi^2=37.411$ df = 4 *p < 0.001
School-aged (5 - 9)	70 (77.8)	15 (16.7)	5 (5.6)	
Adolescents (10 - 19)	87 (63.5)	43 (31.4)	7 (5.1)	
Sex				
Male	79 (66.9)	23 (19.5)	16 (13.6)	$\chi^2=6.669$ df = 2 *p = 0.036
Female	98 (69.0)	37 (26.1)	7 (4.9)	
Schooling status				
Attending school	158 (67.2)	57 (24.3)	20 (8.5)	$\chi^2 = 2.037$ df = 2 p = 0.361
Not attending school	19 (76.0)	3 (12.0)	3 (12.0)	
Level of education				
No formal Education	19 (76.0)	3 (12.0)	3 (12.0)	$**\chi^2 = 13.357$ df = 6 *p = 0.038
Crèche/nursery	35 (68.6)	8 (15.7)	8 (15.7)	
Primary	56 (76.7)	14 (19.2)	3 (4.1)	
Secondary	67 (60.4)	35 (31.5)	9 (8.1)	

χ^2 – chi-square test of association; * Statistically significant; n - number of respondents = 260

** Likelihood ratio used when an expected value was less than 5

Some studies reported healthy eating patterns and high dietary diversity among orphaned children.^{21, 22} The study by Ali et al²² in Ghana even found that orphaned children were significantly more likely to

have high dietary diversity compared to non-orphans. Other studies however found low intake of healthy food types or nutrients and lower dietary diversity among orphaned children.^{2, 23-25}

Table 6: Relationship between Nutritional Status, the Dietary Diversity and the Activity Patterns of the Respondents

Variable	Nutritional status (%)			Statistics
	Underweight	Normal	Over-weight n (%)	
	n (%)	n (%)		
Dietary Diversity				
Low	78 (70.3)	23 (20.7)	10 (9.0)	$\chi^2 = 0.609$ df = 2 p = 0.738
High	99 (66.4)	37 (24.8)	13 (8.7)	
Frequency of involvement in vigorous^v activity				
Rarely/never	82 (67.2)	23 (18.9)	17 (13.9)	$**\chi^2 = 11.133$ df = 4 $*p = 0.023$
< 3 days a week	91 (70.0)	33 (25.4)	6 (4.6)	
≥ 3 days a week	4 (50.0)	4 (50.0)	0 (0.0)	
Average hours of sleep per day				
≤ 8 hours	174 (67.7)	60 (23.3)	23 (8.9)	$**\chi^2 = 1.423$ df = 2 p = 0.491
> 8 hours	3 (100.0)	0 (0.0)	0 (0.0)	
Average time spent watching TV/Video/Satellite per day				
≤ 1 hour	174 (68.5)	57 (22.4)	23 (9.1)	$\chi^2 = 2.767$ df = 2 p = 0.251
> 1 hour	3 (50.0)	3 (50.0)	0 (0.0)	
Average time spent with video games/computer/internet daily				
≤ 1 hour	174 (67.7)	60 (23.3)	23 (8.9)	$**\chi^2 = 1.423$ df = 2 p = 0.491
> 1 hour	3 (100.0)	0 (0.0)	0 (0.0)	

χ^2 – chi-square test of association; * Statistically significant; n - number of respondents = 260

** Likelihood ratio used when an expected value was less than 5

^v - any activity like brisk walking, running, juggling, sports, farming etc. that was engaged for a minimum of 10 minutes and sufficient to make respondents sweat

The difference in the findings in different settings may be a reflection of the care of orphaned children in the different settings. The assessment of the nutritional status of the respondents revealed that the prevalence of stunting, wasting and underweight was high among the children, with about three-fifths of the children stunted, wasted and underweight. This high level of acute (wasting) and chronic (stunting) undernutrition indicates both acute and chronic food deprivation, and should be a source of concern to all stakeholders in health. Further studies, using qualitative or mixed methods design,

to assess the funding and management of the orphanages are recommended, so as to understand the reasons for this high level of food deprivation/undernutrition among the respondents.

Similarly, the study by Nwaneri and Omuemu in Benin City, Nigeria reported that three-quarters of the children in orphanages were stunted.²⁶ Most similar studies also report higher prevalence for undernutrition among children living in orphanages compared to the national prevalence of malnutrition.^{21, 24, 27, 28} The prevalence of under-nutrition in the present study is however, higher than what has

been reported by many similar studies carried out outside Nigeria.^{21, 24, 27, 28} This difference may be due to better funding and/or management in these countries.²⁹ A similar study carried out in Enugu State, southeast Nigeria reported a much lower prevalence of undernutrition, with 27.2% of stunting and 8.4% of underweight.¹⁷ The relatively small sample size (90) and the fact that the study was carried out in a private/faith-based orphanage may be responsible for the low prevalence reported by Eke et al.¹⁷

It was also interesting to find that about 1 in 10 of the respondents were overweight or obese. This prevalence is even higher than the 2% estimated to be the prevalence of overweight among Nigerian children by UNICEF in the State of the World's Children.³ This may be due to the prevalent sedentary lifestyle of the respondents, with only about 3% of the respondents involved in vigorous activity for up to 3 or more days in a week. This was further corroborated with the fact that there was a statistically significant association between nutritional status and involvement in vigorous activity, such that those that rarely or were never involved in physical activity were more likely to be overweight/obese. A previous study on the nutritional status of children living in motherless babies' homes in Enugu State Southeast Nigeria, similarly observed this pattern and the authors opined that this may be because people visiting children living in orphanages commonly donate obesogenic foods.¹⁷

One limitation of the study is the limited information that could be accessed from the caregivers. Especially important is the family and socio-demographic characteristics and whether the children were HIV/AIDS orphans or not. These factors, if known, would have improved the understanding of the determinants of the nutritional status of the respondents.

Conclusion

The study concluded that there was a high prevalence of stunting, wasting and underweight among the children living in orphanages, despite the reported healthy eating patterns and high dietary diversity. There is the need for public health interventions targeted at children living in orphanages in Nigeria. The government and other stakeholders should develop appropriate policy framework to support the nutritional needs of children in orphanages.

Conflict of Interest: None

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